

<b>PROJECT DETAILS</b>
<b>Project Title</b>
Designing for the Future: The Intellectual Property Implications of 3D Printing, 3D Scanning and Mass Customisation
<b>Project Summary</b>
<p>Additive Manufacturing (AM), or 3D printing (3DP) as it is more commonly known, is a rapidly developing emerging technology. This project is designed to capitalise on this innovative and immediate opportunity in order to contribute to knowledge on an area that remains unexplored. Collaborating with Econolyst Ltd, with 20 years experience in this field will further enhance this project.</p> <p>This project will particularly focus on the Intellectual Property (IP) implications arising from 3D printing, 3D scanning and mass customisation. Traditional Mass Production is highly profitable but provides limited flexibility for customising individual objects. 3DP enables mass customisation, where consumers are presented with an 'incomplete product' which they can customise before it is completed.</p> <p>Furthermore, the next 3-5 years will see a proliferation of scanning capabilities leading to real-time photogrammetric and cloud-based data processing to eclipse more traditional laser scanning solutions. Whilst such developments will have an effect on design, it will equally have the potential to infringe IP laws using the capabilities of mobile devices to access cloud services (Brody P., &amp; Pureswaran, 2013).</p> <p>To respond to these issues which raises legal, design and societal questions, the project will initially explore the design shift from traditional mass production to mass customisation thereby highlighting the main advantages and disadvantages.</p> <p>Thereafter, it will consider the design issues brought about by scanning a product which can be reverse-engineered to begin a new cycle of mass customisation. However scanning a finished product by itself does not provide the complete knowledge relating to the design and function of the product - for example the moving parts of a product.</p> <p>Against the backdrop of these innovative technologies, lies the important issue of IP law. Mass customisation/personalisation allows for freedom of design; however where a product is scanned for purposes of personalisation questions pertaining to 'ownership' and 'authorship' arises and raises questions relating to IP laws. For example, who designed the original product before it was scanned? In the course of customisation, can there be a number of 'creators' or 'authors'? If so, who 'owns' the design? Does scanning technology lead to an 'exact copy' - which will have a bearing on IP law. Where ownership is compromised it can lead to IP infringements. This project will identify such challenges and consider ways in which they can be overcome.</p> <p>There is the potential for at least two high quality research publications emanating from this project. (1) The process of traditional manufacturing to mass customisation and implications for IP law; (2) An exploration of the accessible scanning technology and reverse-engineering in 3DP and the impact on IP law. As a project with original contribution to knowledge, it also has the potential to be published as a monograph.</p>
<b>Academic Impact</b>
<p>The original contribution to knowledge brought about by this project will inform policy and legislation. 3DP technology is not completely new and the manner in which it works has been explored. However this project which will focus on the specific elements of mass customisation and accessible scanning technology whilst crossing boundaries with Intellectual Property Law will provide for the first research project of its kind in the UK. Since 3DP entered the mass market a few years ago, a number of questions relating to Intellectual Property Law has arisen</p>

which needs investigation and dissemination of knowledge.

As such, the research carried out for the PhD will result in journal articles in reputed international academic journals. Drawing on multi-disciplinary expertise from the Business School, Law Department and the Faculty of Science and Technology, the project has the potential to reach a wider academic audience and have a greater impact. Most importantly, there is a gap in the academic market for a monograph in this area which can be fulfilled through this research project.

### **Societal Impact**

The research project will promote multi-disciplinary networking and collaboration into 3DP research involving the Business School and Faculty of Science and Technology at Bournemouth University, Econolyst Ltd and the wider 3DP community.

The multi-disciplinary networking and collaboration will be promoted through the setting up of targeted workshops in Year 2 and an international conference at the end of the research project in Year 3. The impact of these events will benefit the wider BU staff, students - both within and outside BU, professionals, academics, SMEs and the wider community in understanding 3DP as it relates to design, innovation and implications for law.

A further outcome will be the involvement in the London-based 3D Print Show (also held in Paris and New York annually) which will lead to direct interaction with external stakeholders and in turn will provide benefits such as enhanced learning opportunities.

Following the success and recognition through several recent funding grants won by members of the supervisory team, BU is in a unique position to respond to this current and pressing opportunity in the area of 3DP and build on the current research being carried out by the supervisory team.

### **Training Opportunities**

The doctoral student will benefit from the sponsorship provided by Econolyst Ltd through which the research student will also have an opportunity of a placement at Econolyst Ltd. This will enable the student to understand the practice behind the research. Econolyst Ltd is a UK based Additive Manufacturing and 3D Printing consultancy and research firm working with a broad range of clients around the world and has helped hundreds of companies to get the most out of these technologies. Econolyst has significant experience and networking opportunities within the 3D printing sector.

The candidate will also be exposed to attending workshops and conferences dedicated to 3DP. Namely the International Conference on Additive Manufacturing and 3D Printing held annually at Nottingham University and jointly organised in conjunction with Econolyst Ltd.

The doctoral student will also benefit from the 3D Printing expertise at Bournemouth University in particular from the 3D Printing suite located in the Faculty of Science and Technology whilst being exposed to the legal side from the expertise brought about by the Centre for Intellectual Property Policy and Management.

The supervisory team will further ensure that the candidate attends the relevant training workshops organised by Bournemouth University, to enhance the research.

## **2. SUPERVISORY TEAM & RESEARCH ENVIRONMENT**

<b>First supervisor</b>	1. Dr. Dinusha Mendis
<b>Additional supervisors</b>	2. Dr. Tania Humphries-Smith 3. Dr. Phil Reeves (Econolyst)
<b>Recent publications by supervisors relevant to this project</b>	Mendis D., 'Clone Wars: Episode 1 – The Rise of 3D Printing and its Implications for Intellectual Property Law – Learning Lessons from the Past?' [2013] European Intellectual Property Review pp. 155-169. Mendis D., 3D Printing Enters the Fast Lane [July 2014] Intellectual Property

	<p>Magazine, pp. 39-40.</p> <p>Mendis D., 'Clone Wars: Episode II - The Next Generation: The Copyright Implications relating to 3D Printing and Computer-Aided Design (CAD) Files [2014] Law, Innovation and Technology (Forthcoming)</p> <p>Mendis D., Secchi D., &amp; Reeves P., The Legal and Empirical Study into the Intellectual Property Implications of 3D Printing (London: Intellectual Property Office; 2014) (Forthcoming)</p> <p>Humphries-Smith T, Romouzy-Ali A, Noroozi S, Sewell P. Adopting Rapid Prototyping Technology within Small and Medium-Sized Enterprises: The Differences between Reality and Expectation, International Journal of Innovation, Management and Technology, 3(4):427-432 Aug 2012</p> <p>Romouzy Ali AM, Noroozi S, Sewell P, Humphries-Smith T. The Barriers Hindering Rapid Prototyping Deployment within Small and Medium-Sized Enterprises: Which Should Come First?. Twelfth International Conference on Knowledge, Culture and Change Management, Chicago, USA, 06 Jul 2012 - 08 Jul 2012. 2012</p> <p>Reeves P., Hague R., Additive Manufacturing or 3D printing - you Decide! (June 2013) Ingenia, The Royal Academy of Engineering Magazine, pp. 39-45</p> <p>Reeves P., Testing Times for Additive Manufacturing (November 2010) MWP, (Sector Report: Aerospace) pp. 20-22</p>
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<b>INFORMAL ENQUIRIES</b>
To discuss this opportunity further, please contact Dr Dinusha Mendis via email: <a href="mailto:dmendis@bournemouth.ac.uk">dmendis@bournemouth.ac.uk</a>
<b>ELIGIBILITY CRITERIA</b>
<p>All candidates must satisfy the University's minimum doctoral entry criteria for studentships of an honours degree at Upper Second Class (2:1) and/or an appropriate Masters degree. An IELTS (Academic) score of 6.5 minimum (or equivalent) is essential for candidates for whom English is not their first language.</p> <p>Additionally, successful candidates must have an honours degree and/or an appropriate Master's degree in Product Design <u>or</u> Intellectual Property Law.</p>
<b>HOW TO APPLY</b>
Please complete the <a href="#">BU Research Degree Application 2014</a> and submit it via email to the Research Administrator for Admissions: Suzy Kempinski - <a href="mailto:pgradmissions@bournemouth.ac.uk">pgradmissions@bournemouth.ac.uk</a> by <b>12 March 2015</b> . Further information on the application process can be found at <a href="http://www.bournemouth.ac.uk/phd2014">www.bournemouth.ac.uk/phd2014</a>